



Claims

What is claimed is:

1. An inflatable airbag spinal protector system comprising:

A gas impermeable inner bladder constructed of 2 sheets of PVC sheet plastic, or similar material, radio frequency welded at the edges such that upon inflation, fashions an aerodynamic, L shaped curve adapted to the thigh, lumbar, thoracic and cervical regions. The inner bladder incorporates a circular vent in the upper, posterior region consisting of a ring of PVC tubing of variable diameter, to permit controlled gas venting upon impact, and a separate inflation, deflation valve port in the lower lateral region.

An expandable, cylindrical, balloon slave chamber, constructed of synthetic rubber or similar material, which connects to the inner layer by attaching to the circular vent.

An outer, fabric bag comprised of sewn Dacron that services to surround, constrain and protect the inner bladder and including a reinforced hole in the upper, posterior region to permit external passage of the circular vent for external attachment of the balloon slave chamber.

An optional, ram air inflated, aerodynamic cowling constructed of Dacron fabric and attached to the mid to upper, posterior portion of the outer fabric bag, which surrounds and protects the balloon slave chamber, and is of sufficient size to permit full, unrestricted expansion of the balloon slave chamber. The cowling is shaped such, that when inflated, imparts aerodynamic streamlining and drag reduction, enhancing gliding performance. The cowling incorporates a semicircular opening in the undersurface of the airbag to allow air entry and cowling inflation with forward speed of the glider after the manner of a wind sock.

2. An airbag spinal protector system in accordance with claim 1, wherein the airbag is inflated prior to use through a single valve inlet, by mechanical pump or mouth,

and remains inflated and deployed throughout use. Deflation after use allows small packing volume and easy transport.

3. An inflatable airbag spinal protector in accordance with claim 1, wherein the concomitant use of an expandable, rubber balloon, slave chamber allows air to vent from the internal bladder into the expanding balloon slave chamber, absorbing impact energy in venting the air and expanding the rubber chamber, thus imparting continuous and immediate impact resistance . Internal air compression and elastic recoil off a sealed, inflated chamber is thus avoided, and external air escape and loss of internal air volume at inappropriate times, prevented (as occurs with pressure triggered, dump valves during air density changes with altitude).

4. An airbag spinal protector in accordance with claim 3, wherein the concomitant use of an expandable, balloon slave chamber permits maintenance of internal air pressure at a significant level above ambient, atmospheric pressure. On impact this prevents air displacement to other regions of the bag as occurs in non-pressurized systems, and forces displaced air to exit primarily through the external vent wherein impact energy is absorbed. This renders the use of multiple chambers and internal partitions redundant, maximizes internal volume, imparts instantaneous impact absorption, and provides optimal impact resistance throughout airbag thickness thus preventing occupant free fall into the bag for any portion of its thickness.

5. An airbag spinal protector in accordance with claim 3, wherein the concomitant use of an expandable balloon slave chamber compensates for changes in air density and pressure with rising or descending altitude to maintain a high, effective, internal pressure independent of external, air density.

6. An airbag spinal protector in accordance with claim 1 wherein the use of a ram air inflated, streamlined, aerodynamic cowling provides a separate, non-pressurized chamber in which the balloon, slave chamber can fully expand without restriction or imparting additional aerodynamic drag and performance degradation.